

# USACE Levee Safety Program

## Levee Safety as a Component of Flood Risk Management

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Eric Halpin, P.E.  
Special Assistant for Levee Safety  
Headquarters, US Army Corps of Engineers



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## Topics

- **Foundation of a Safety Program**
  - Mission
  - Vision
  - Components of a Safety Program
- **Levee Safety within the Universe of Flood Risk Management**



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## Levee Safety Program Mission



West Columbus, Ohio

**Assess** the integrity and viability of levees and recommend **actions** to assure that levee systems do not present unacceptable risks to the public, property, and the environment.

### Program Objectives:

- Hold Public Safety Paramount
- Reduced Economic Impacts
- Maximize Cost Effectiveness
- Develop Reliable and Accurate Information
- Build Public Trust and Acceptance



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## Levee Safety Vision Statement

- ***“A Safe Public and Reduced Economic Losses by means of Reliable Levees – part of an Integrated Solution to Flooding.”***
  - (borrowed from the National Committee on Levee Safety, October 2008)



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## Context: Levee Truths...

- There is currently no National policy relating to the safety of levees.
- The number and location of all the levees in the U.S. is currently unknown.
- Levees are now abundant and integral to economic development in many communities in the United States
- Flood risk management involves a plethora of strategies, techniques and tools. However, in many instances, levees have been the primary tool.



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## Context: Levee Truths...

- Although proven beneficial in investment and function, levees have inadvertently increased flood risks in the country by attracting development in the flood plain
- Levees only reduce the risk to individuals and structures behind them. They do not eliminate the risk.
- Government officials and the general public often have only a limited understanding of levees and the risks associated with them
- Many levees were originally constructed without the benefit of modern engineering techniques and provide only limited protection to communities.
- Many levees originally constructed to protect agricultural fields now protect large urban communities



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## Context: Levee Truths...

- Many urban areas protected by levees, particularly those in deep floodplains, have an unacceptably low level of flood protection and an unacceptably high risk. Failure of such levees can result in high loss of life, property damage, and economic losses. This is a national security issue.
- The reliability of levees is not commonly known, even to those entities that operate and maintain them.
- Safety programs can and should provide improved public safety through the close scrutiny of levee conditions and risks posed, and the communication of those findings to decision makers and affected populations



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## What Levee Safety is:

- 1) Sound technical practices to levee design, construction, operation, assessment, security, and maintenance
- 2) Effective public education and awareness of risks involving levees (joint with FRMP)
- 3) Competent safety programs for existing levees that emphasize the protection of human life
- 4) Feasible governance solutions at all levels of government that encourage and sustain effective safety programs



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## Sound Technical Practices

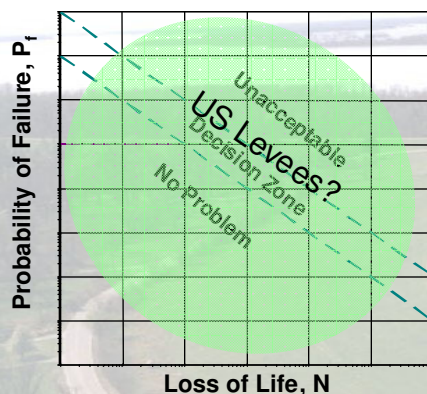
- Levee Certification EC
- Comprehensive Levee Safety ER
- More Robust Routine Inspections
- Interim Risk Reduction Measures
- Improved Design Guidance
  - I-Walls, PFMA, Seepage, Stability, Resiliency
- Levee Inventory



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## Education and Awareness of Risks

Risk Relationship by Area



- Focus on Life Safety Risks:
  - How well do we know them?
  - What is tolerable?
  - What is there proximity to tolerable?
- What are the Most Cost Effective Approaches to Risk Reduction?
  - Structural
  - Non-Structural
  - Interim Measures

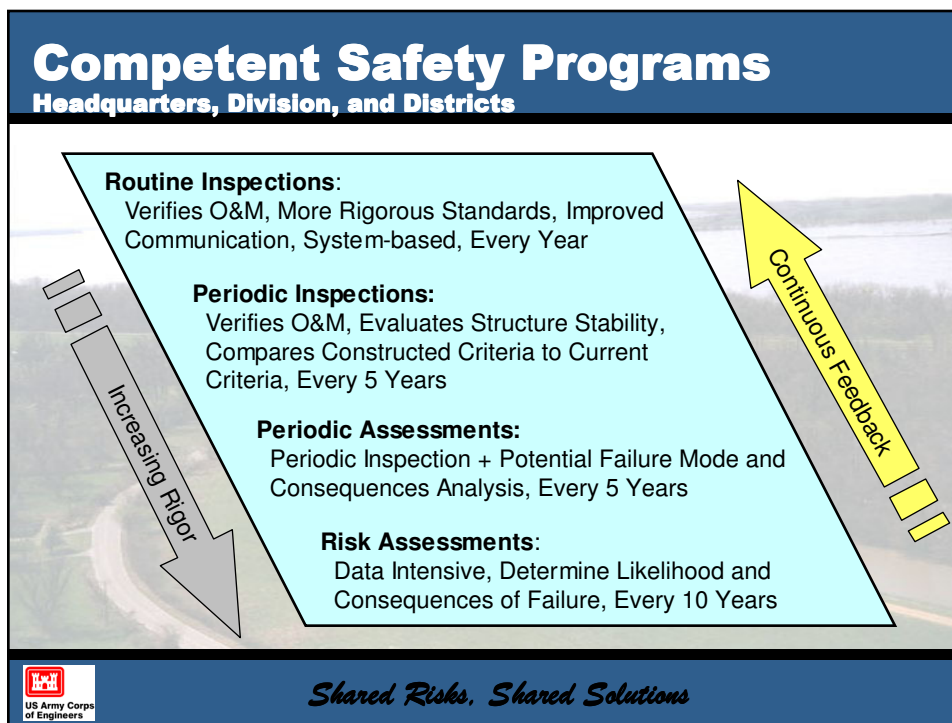


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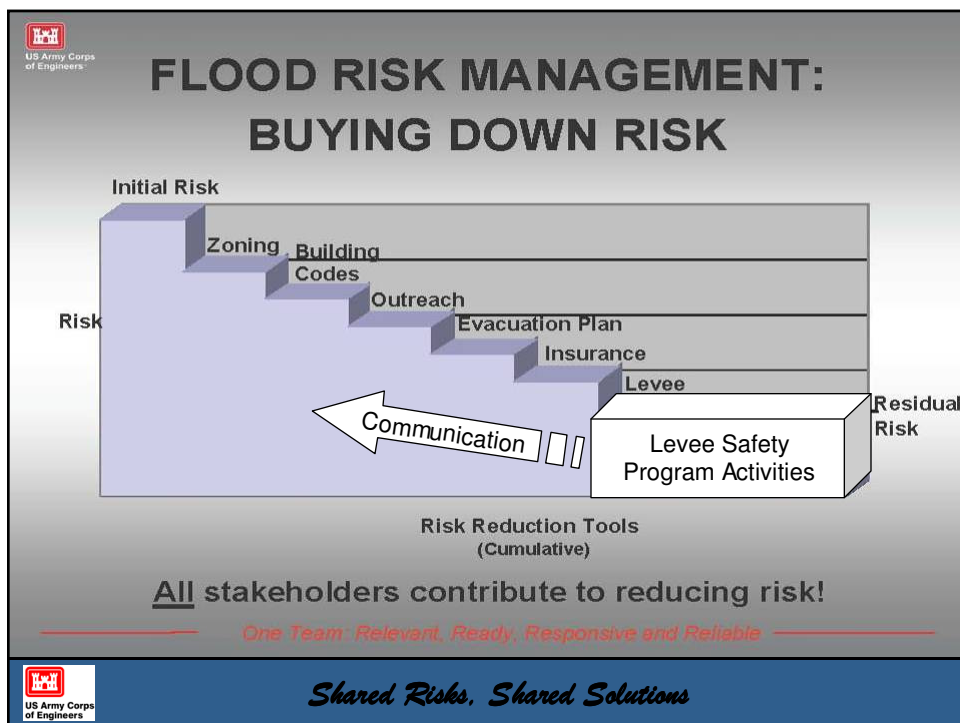
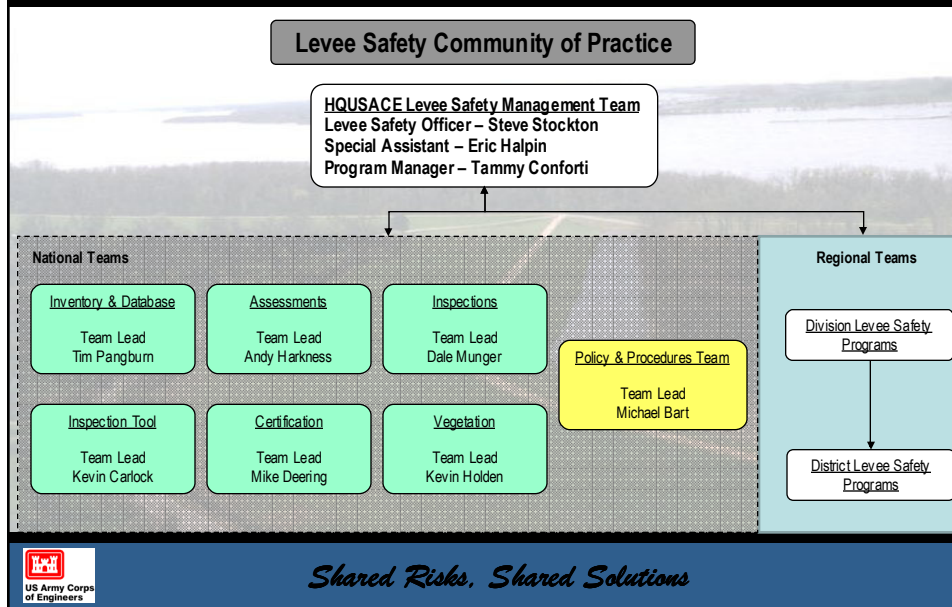
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Levee Safety Action Class	USACE Levee Safety Action Classification Table <sup>1,2</sup>	Characteristics of this class	Actions for levees in this class
I URGENT AND COMPELLING (Unsafe)	<div style="writing-mode: vertical-rl; transform: rotate(180deg);"> <b>Risk and Safety Characterization</b>   <b>Risk Description</b>   <b>Consistent Communication</b>   <b>Risk Informed Action</b>   <b>Consistent Measures</b> </div>	<b>LIKELY FAILURE AT LESS THAN PROTECTED HEIGHT</b> Levee line-of-protection system likely to fail from erosion, loss of structural stability, under-seepage, or other causes at flood heights below top of levee. Population at risk > 10,000; high hazard potential classification. <b>OR EXTREMELY HIGH RESIDUAL RISK</b> Residual risk from overtopping is moderate for urban floodplains with less than 50-year level of protection and population at risk > 10,000.	Take immediate action to prevent imminent failure. Validate classification through an external peer review. Implement interim risk reduction measures, including potential interim upstream storage operational changes; ensure that warning and emergency action plan is current and functionally tested. Notify owner, state, Federal and local officials; require owner develop remedial plan to address deficiencies. Mount intensive campaign to promote purchase of flood insurance. Schedule for highest priority risk assessment.
II URGENT (Unsafe)		<b>FAILURE LIKELY AT PROTECTED HEIGHT</b> Levee line-of-protection system likely to fail from erosion, loss of structural stability, under-seepage, or other causes at flood heights reaching top of levee. Population at risk > 10,000; high potential hazard classification, level of protection less than 100-year. <b>OR VERY HIGH RESIDUAL RISK</b> Residual risk from overtopping is moderate for urban floodplains with less than 100-year level of protection and population at risk > 10,000; or rural floodplains with population at risk > 10,000 and level of protection less than 50-year.	Implement interim risk reduction measures, including potential interim upstream storage operational changes; ensure that warning and emergency action plan is current and functionally tested. Notify owner, state, Federal and local officials; require owner develop remedial plan to address deficiencies. Mount intensive campaign to promote purchase of flood insurance. Conduct heightened monitoring and schedule for high priority risk assessment.
III HIGH PRIORITY (Conditionally Unsafe)		<b>FAILURE POSSIBLE AT PROTECTED HEIGHT</b> Levee line-of-protection system likely to fail from erosion, loss of structural stability, under-seepage, or other causes at flood heights reaching top of levee. Population at risk > 10,000; significant or high hazard potential classification, level of protection less than 100-year. <b>OR HIGH RESIDUAL RISK</b> Residual risk from overtopping is moderate for urban floodplains with population at risk > 10,000; agricultural areas with level of protection less than 50-year and population at risk > 10,000.	Ensure that warning and emergency action plan is current and functionally tested. Notify owner, state, Federal and local officials; require owner develop remedial plan to address deficiencies. Mount energetic campaign to promote purchase of flood insurance. Prioritize for risk assessment and opportunities for remediation considering consequences and other factors.
IV PRIORITY (Marginally Safe)		<b>FAILURE LESS LIKELY AT PROTECTED HEIGHT</b> Levee line-of-protection system likely to fail from erosion, loss of structural stability, under-seepage, or other causes at flood heights reaching top of levee. Population at risk > 10,000; significant or high hazard potential classification, level of protection at least 100-year. <b>OR HIGH RESIDUAL RISK</b> Residual risk from overtopping is moderate for urban floodplains with population at risk > 10,000; agricultural areas with level of protection less than 50-year and population at risk > 10,000.	Ensure that warning and emergency action plan is current and functionally tested. Notify owner, state, Federal and local officials; require owner develop remedial plan to address deficiencies. Mount campaign to promote flood insurance. Normal priority of scheduling risk assessment.
V NORMAL (Safe)		<b>ADEQUATELY SAFE</b> Levee is considered safe, meeting all essential USACE guidelines with no unconfirmed levee safety issues. Levee provides at least 100-year level of protection and is NCEP certified. <b>AND RESIDUAL RISK IS CONSIDERED TOLERABLE.</b>	Continue routine levee safety activities, normal operation and maintenance. Ensure that warning and emergency action plan is current and functionally tested. Continue advocate wise floodplain land use planning including purchase of supplemental (not mandatory) flood insurance.

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# Levee Safety Governance



[illegible]An aerial photograph showing a winding road that runs parallel to a river. The road is light-colored, possibly gravel or dirt, and curves through a green landscape. The river is a muddy brown color and flows alongside the road. In the background, there are dense green trees and a distant shoreline with some buildings. The word "Discussion" is written in large, bold, black letters across the center of the image.

# Discussion

The logo of the US Army Corps of Engineers, featuring a red shield with a white bridge and the text "US Army Corps of Engineers" below it.

US Army Corps  
of Engineers

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